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November 11, 2004

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APPLICATION NUMBER: 60/513,361

FILING DATE: *October 22, 2003*

RELATED PCT APPLICATION NUMBER: PCT/US04/34770

Certified by



Jon W Dudas

Acting Under Secretary of Commerce
for Intellectual Property
and Acting Director of the U.S.
Patent and Trademark Office

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV 287981993 US

INVENTOR(S)					
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)			
Harry Judith Steven	Leneau Leneau Allday	Jasper, MO Jasper, MO Shelbyville, KY			
<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
Colostrum Compositions and Methods					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
<input checked="" type="checkbox"/> Customer Number		23643			
OR					
<input type="checkbox"/> Firm or Individual Name					
Address					
Address					
City		State	ZIP		
Country		Telephone	Fax		
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages		9	<input type="checkbox"/> CD(s), Number		
<input type="checkbox"/> Drawing(s) Number of Sheets			<input checked="" type="checkbox"/> Other (specify)		Postcard
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.				FILING FEE AMOUNT (\$)	
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number		10-0435			\$80.00
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: _____					

Respectfully submitted,

SIGNATURE

Date

10/22/03

TYPED or PRINTED NAME

Jill T. Powlick

REGISTRATION NO.

42,088

(if appropriate)

Docket Number:

29792-73465

TELEPHONE

317-231-7504

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application,

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) \$80.00

Complete if Known

Application Number	Unknown
Filing Date	Herewith (Oct. 10, 2003)
First Named Inventor	Harry Leneau et al.
Examiner Name	Unknown
Art Unit	Unknown
Attorney Docket No.	29792-73465

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number: 10-0435

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The Director is authorized to: (check all that apply)

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	80.00
SUBTOTAL (1)			(\$) \$80.00

2. EXTRA CLAIM FEES FOR UTILITY AND

Extra Claims		Fee from below	Fee Paid
Total Claims	-20** = 0	X	0.00
Independent Claims	-3** = 0	X	0.00
Multiple Dependent			

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1202 18	2202 9	Claims in excess of 20	
1201 86	2201 43	Independent claims in excess of 3	
1203 290	2203 145	Multiple dependent claim, if not paid	
1204 86	2204 43	** Reissue independent claims over original patent	
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) (\$) \$0.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	2053 130	Non - English specification	
1812 2,520	2812 2,520	For filing a request for <i>ex parte</i> reexamination	
1804 920*	2804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	2805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	2451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	2460 130	Petitions to the Commissioner	
1807 50	2807 50	Processing fee under 37 CFR § 1.17(q)	
1806 180	2806 180	Submission of Information Disclosure Statement	
8021 40	28021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	2802 900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) _____

SUBMITTED BY

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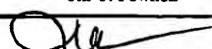
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Date

October 22, 2003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group: Unknown
Attorney Docket: 29792-73465
Applicant: Harry Leneau et al.
Invention: COLOSTRUM COMPOSITIONS AND METHODS
Filed: Herewith (October 22, 2003)
Examiner: Unknown

CERTIFICATE UNDER 37 C.F.R. § 1.10

Mail Stop Provisional Patent Application
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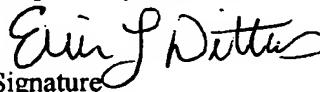
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Date of deposit: October 22, 2003

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Respectfully submitted,



Signature

Erin L. Dittus

Typed or Printed Name

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INDS02 JTP 615844v1

Express Mail No. EV 287981993 US

PROVISIONAL PATENT APPLICATION
of
HARRY LENEAU
JUDITH LENEAU
And
STEVEN ALLDAY
for
COLOSTRUM COMPOSITIONS AND METHODS

Attorney Docket 29792-73465

COLOSTRUM COMPOSITIONS AND METHODS

FIELD OF THE INVENTION

5 The present invention relates to a composition and method for providing protection against pathogens. More particularly, this invention provides compositions comprising colostrum for use in providing protection against pathogens.

BACKGROUND AND SUMMARY OF THE INVENTION

10 Bovine Respiratory Disease Complex (BRD) is a multivalent disease of cattle, one segment of which is known as "shipping disease." BRD is caused by both viral and bacterial pathogens, and more than 20 different viruses and approximately six common bacterial pathogens are associated with the disease. Typically, the bacterial challenges follow a viral challenge. Illustrative viral
15 pathogens include Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea (BVD), Parainfluenza 3 (PI-3), and Bovine Respiratory Syncytial Virus (BRSV).

 Colostrum is a substance secreted in the first few days post-partum prior to onset of true lactation. Colostrum contains proteins, carbohydrates, fats, vitamins, and minerals. In addition, colostrum contains bioactive components such as
20 growth factors and antimicrobial factors. The antimicrobial factors include immunoglobulins, lactoperoxidase, lysozyme, and lactoferrin. Bovine colostrum is extremely rich in immunoglobulins. The concentration of IgG1 (52-87 g/l), IgG2 (1.6-2.1 g/l), IBM (3.7-6.1 g/l), and Riga 3.2-6.2 g/l) in bovine colostrum is approximately 100 fold higher than in normal bovine milk. Colostrum is routinely
25 provided to calves, both for its nutritional and its antimicrobial effects. However, colostrum, by its nature, is not a sterile product, and its use has been generally limited to oral ingestion.

 The present invention is directed to a colostrum product and a method of using the colostrum product. The colostrum product may be filtered and sterilized,
30 and may be injected, illustratively subcutaneously and intravenously. Subcutaneous and intravenous injections of filtered sterile colostrum have been demonstrated to provide beneficial effects against Infectious Bovine Rhinotracheitis (IBR), Bovine

Viral Diarrhea (BVD), Parainfluenza 3 (PI-3), and Bovine Respiratory Syncytial Virus (BRSV).

Additional features of the present invention will become apparent to those skilled in the art upon consideration of the following detailed description of the preferred embodiments.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with the present invention, a method is provided for providing an animal protection against pathogens. The method comprises delivering to the animal by injection a composition comprising an effective amount of a colostrum product. An "effective amount" as used herein refers to the amount of colostrum product which, upon injection, provides protection against pathogens. The colostrum product is illustratively colostrum that has been sterilized to provide a product that meets acceptable sterility requirements for injection. The colostrum used to make the colostrum product is also illustratively filtered to remove large components to provide a composition that is more compatible with injection. The animal illustratively may be a warm-blooded vertebrate, illustrative a bovine, ovine, equine, or porcine species, and the pathogens may be pathogens frequently encountered in commercial farming, breeding, or raising of the animal species. In one illustrative embodiment, the animal is a bovine calf, and the method is used to provide protection against IBR, BVD, PI-3, or BRSV. Illustratively, the colostrum is obtained from a post-partum female of the same species. However, it is understood that the colostrum product may be obtained from an animal of one species and used to provide protection to an animal of another species. Furthermore, it is understood that the animals discussed herein are illustrative only, and the colostrum product may be used to provide protection to other animals, particularly other warm-blooded vertebrates. Illustratively, the colostrum product may be used independently, or may be used in conjunction with a vaccination protocol.

EXAMPLES**Example 1: Preparation of Sterile Highly Filtered Bovine Colostrum**

Colostrum was obtained from Grade A dairy herds. The raw colostrum
 5 is filtered through a series of filters, illustratively starting with a 10 micron filter,
 followed by a 5 micron filter, and finishing with a 3 micron filter. Illustratively
 Millipore® filters (Billerica, MA) with polyester felt filter bags are used. The
 filtration removes large components, such as aggregates of lipids, proteins, and other
 materials, which may interfere with absorption or may result in sterile abscesses.
 10 Other filtration protocols, as are known in the art, may be used to remove the large
 components.

The filtered colostrum is packaged in containers and frozen.
 Sterilization is accomplished by 1.0 to 4.5 Mrad gamma-irradiation. Illustratively, the
 sterilization takes place on frozen or highly refrigerated colostrum, to prevent or
 15 minimize denaturation. While gamma-irradiation is used for sterilization of the
 illustrated embodiment, other methods of sterilization are contemplated and are within
 the scope of this invention. Such other methods include, but are not limited to, UV
 light and heat. Such methods may be time and/or temperature sensitive.
 Illustratively, the sterile product would be provided refrigerated.

20 Immunoglobulin levels in the sterile highly filtered colostrum were
 obtained from an independent lab (VMRD, Inc., Pullman, WA). IgG, IgA, and IgM
 levels do not vary significantly from those of the raw colostrum, as follows:

	Raw Colostrum (mg/100ml)	Sterile Filtered Colostrum (mg/100ml)
25 IgA	250	240
IgG	4200	3700
IgM	190	170

30 These immunoglobulin levels are much higher than the serum immunoglobulin levels
 prior to treatment of the calves of the test group discussed below.

Example 2: Preparation of Composition

35 The sterile highly filtered colostrum was packaged without a carrier.
 However, standard carriers and excipients, as are known in the art may be used.

Dosages of 1 µl to 1000 ml may be provided, preferably, about 0.1 to 100 ml, most preferably about 25 to 75 ml. Dosages may be adjusted due to the size and species of the animal. In calves, a dose for a newborn animal may be 20-40 ml; in a 200-400 lb animal a dose of 40-60 ml may be used, and in larger calves of > 400 lbs, a single dose of 100 ml may be provided, or several doses of 100 ml may be provided in multiple sites. Illustratively a dose of 50 ml is used.

Example 3: IBR Viral Challenge Subsequent to Subcutaneous Injection

Ten calves were used in this study. The calves were observed for ten days prior to commencement of the study, to insure that each calf is healthy.

Day 1: blood samples for viral titers were obtained, nasal swabs were obtained, and each calf was ear tagged. The calves were divided into two groups of five calves each. Each of the five calves in the test group were given a subcutaneous injection of 50 cc of the colostrum as prepared in Example 1. Each of the five calves in the control group were given a subcutaneous injection of 50 cc of fetal bovine serum, which was free of immunoglobulins.

Day 2: all ten calves were challenged with a live viral mixture containing IBR. 3.0 cc of the live virus was introduced into each nostril.

Days 3-8: nasal swabs were obtained from both sides of the nasal cavities of each calf. Each day the viral swabs were placed in viral transport medium, kept cold, and shipped overnight to the laboratory.

IBR virus shedding was reduced by 72% in the test group animals, as compared to the control animals. No test animals required any antibiotic treatment for symptoms. Among the control animals, one calf required no antibiotic treatment, three calves required two days of treatment, and one calf required four days of treatment.

The results of this study demonstrated a significant reduction in IBR virus shedding, as well as a significant reduction in symptoms.

Example 4: BVD Viral Challenge Subsequent to Subcutaneous Injection

This study was performed in the same manner as the study of Example 3, except that 3.0 cc of BVD was introduced into each nostril.

BVD virus shedding was reduced by 63% in the test group animals, as compared to the control animals. No test animals required any antibiotic treatment for symptoms. Among the control animals, one calf required two days of treatment, four calves required two days of treatment, and one calf required four days of treatment.

5 The results of this study demonstrated a significant reduction in BVD virus shedding, as well as a significant reduction in symptoms.

Example 5: PI-3 Viral Challenge Subsequent to Subcutaneous Injection

10 This study was performed in the same manner as the study of Example 3, except that 3.0 cc of PI-3 was introduced into each nostril.

PI-3 virus shedding was reduced by 81% in the test group animals, as compared to the control animals. One test animal required two days of antibiotic treatment. None of the other four test animals required any antibiotic treatment for symptoms. Among the control animals, all five calves required two days of treatment.

15 The results of this study demonstrated a significant reduction in PI-3 virus shedding, as well as a significant reduction in symptoms.

Example 6: BRSV Viral Challenge Subsequent to Subcutaneous Injection

20 This study was performed in the same manner as the study of Example 3, except that 3.0 cc of BRSV was introduced into each nostril.

BRSV virus shedding was reduced by 11% in the test group animals, as compared to the control animals. No test animals had any symptoms and none required any antibiotic treatment. Among the control animals, two calves had no symptoms and required no antibiotic treatment, two control group calves had elevated temperatures of 102-104°F and loss of appetite for two days, and one control group calf had elevated temperatures of 103-104°F and loss of appetite for two days.

The results of this study demonstrated a significant reduction in BRSV virus shedding, as well as a significant reduction in symptoms.

30 Although the invention has been described in detail with reference to certain preferred embodiments, those skilled in the art will recognize that the invention can be practiced with variations and modifications within the scope and spirit of the invention as described and defined in the following claims.

CLAIMS:

- A1. A composition comprising sterile bovine colostrum that has been highly filtered.
- 5 A2. The composition of claim A1 provided in injectable form.
- A3. The composition of claim A2 provided in a syringe.
- A4. The composition of claim A2 further comprising a carrier suitable for injection.
- 10 B1. A method of preparing sterile highly filtered colostrum comprising the steps of
filtering colostrum to remove large components while retaining antibodies, and
sterilizing the colostrum.
- 15 B2. The method of claim B1 wherein the sterilizing step is performed by gamma irradiating the sample.
- B3. The method of claim B1 wherein the filtering step is performed by filtering the colostrum through a series of filters.
- 20 B4. The method of claim B3 wherein the series of filters comprises a 10 micron filter, a 5 micron filter, and a 3 micron filter.
- C1. A method for providing an animal protection from disease comprising the step of
injecting animal with a dose of colostrum.
- 25 C2. The method of claim C1 wherein the colostrum is sterilized.
- C3. The method of claims or C2 wherein the colostrum is highly filtered.
- C4. The method of claim C1 wherein the animal is a warm-blooded mammal.
- 30 C5. The method of claim C4 wherein the warm-blooded mammal is a bovine.
- C6. The method of claim C5 wherein the bovine is a calf.

-7-

C7. The method of claim C4 wherein the warm-blooded mammal is a juvenile.

C8. The method of claim C4 wherein the colostrum is obtained from an animal of the same species as the warm-blooded mammal.

5 C9. The method of claim C1 further comprising the step of injecting the animal with a second dose of colostrum at a subsequent date.

ABSTRACT

Colostrum products and a methods of using the colostrum products are
5 provided. Methods are provided for preparing the colostrum products, which may be
filtered and sterilized. The colostrum products may be injected, illustratively
subcutaneously and intravenously, to provide an animal protection from disease.

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